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**The Forbidden Weapon - The Employment
of Army Tactical Nuclear Weapons**

**A Monograph
by**

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Military Intelligence**

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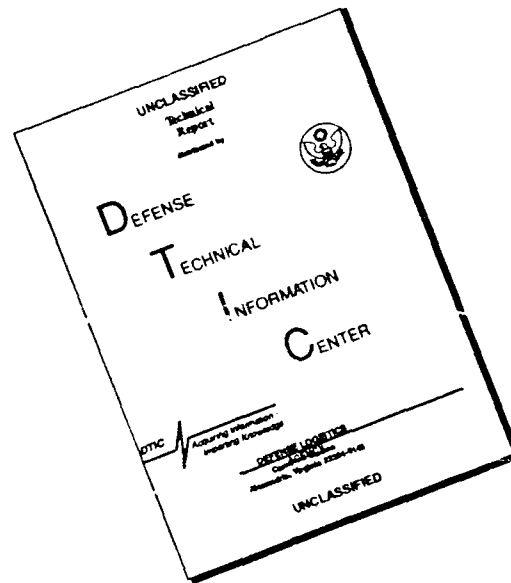
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ABSTRACT

THE FORBIDDEN WEAPON - EMPLOYMENT OF ARMY TACTICAL NUCLEAR WEAPONS, by Lieutenant Colonel John D. Skelton, USA, 49 pages.

The United States has possessed tactical nuclear weapons (TNW) since the early 1950's. Initially developed for deployment to Europe to offset the Soviet/Warsaw Pact's huge conventional superiority and to deter war, these weapons have never been used in combat. With the demise of the Cold War, a desire to reduce nuclear weapon stockpiles, and the capability of sister services to employ TNW, if needed, the Army must decide whether it needs to retain its capability to employ TNW.

Following a discussion of the evolution of TNW theory and a historical review of the Army's TNW capability, this monograph addresses whether or not the Army needs the capability to employ TNW in future war. The analysis suggests that the Army should relinquish its TNW capability because of a decreased threat from the Soviet Union, the availability of Air Force and Navy TNW to support a theater Commander-in-Chief (CINC), and to avoid redundant TNW capabilities in an era of fiscal constraints. Before the Army gives up its TNW capability, however, the Department of Defense must ensure that the Air Force and Navy can perform all TNW missions in support of a CINC.

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INTRODUCTION

The Forbidden Weapon -

Employment of Army Tactical Nuclear Weapons

Modern, short-range nuclear forces will be an essential element in maintaining deterrence, as well as in assuring the lethality of the future Army. The Army's nuclear capabilities will remain an irreplaceable link between conventional forces and US intercontinental nuclear forces. To be credible, they must be visible and militarily effective and in sufficient numbers.

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The United States has had the capability to employ tactical nuclear weapons (TNW), sometimes called "battlefield" nuclear weapons, for forty years. TNW can be employed by land, sea, or air forces against opposing forces, supporting installations, or facilities. These weapons may be employed in support of a military mission of limited scope or in support of the military commander's scheme of maneuver. The employment of tactical nuclear weapons is usually limited to the area of military operations.¹ A theater warfighting Commander-in-Chief, or "CINC", may have tactical nuclear weapons available for employment by one or more of the nation's four armed services in the theater of war.

The purpose of this monograph is to determine if the Army needs to retain its TNW capability. This is a relevant issue for several reasons as the Cold War, which accentuated the need for the development and deployment of TNW, thaws.

First, the Intermediate Nuclear Forces (INF) Treaty of 1988 eliminated the Army's Pershing II nuclear weapon delivery system. Secondly, remaining Army tactical nuclear weapons systems may be negotiated to reduced levels or relinquished in the not too distant future for arms control or budgetary reasons. Additionally, the "threat" of a Soviet/Warsaw Pact attack in Europe against the North Atlantic Treaty Organization, including the Seventh U.S. Army in Germany, has greatly diminished in the past two years.

Additional considerations include the growing concerns about the proliferation of nuclear weapons and a desire to reduce existing stockpiles of nuclear weapons around the world which also suggest a need to look at what quantities and types of strategic or tactical nuclear weapons are needed now and in the future. Furthermore, the potential for a major land war in Southwest Asia against Iraq, where United States forces are deployed for Desert Shield, also suggests a need to evaluate what role, if any, Army tactical nuclear weapons might play in future war.

The question is not whether the Army must use such weapons, but rather, does the Army need the capability to do so. Although related, these two questions are distinctly separate. This distinction concerns the deterrence and war limiting potential of such weapons versus their actual use. For example, some historians suggest that President Dwight D. Eisenhower's hint of using nuclear weapons in Korea prompted the Chinese to negotiate seriously about terminating that stalemate.² Determining

whether or not the Army needs the capability to employ TNW in future war is also important for the development of joint warfighting doctrine, Army doctrine, Department of Defense force structure, and national nuclear policies.

Before proceeding further, it is important to suggest that the descriptive term, tactical nuclear weapon, is somewhat a misnomer. The term tactical nuclear weapon apparently was coined in the early 1950's to differentiate such "battlefield" weapons from the bomber and later missile delivered strategic nuclear weapons predominately directed against strategic military, industrial, economic, or political targets.³ In reality tactical nuclear weapons are much more than "tactical" in nature and effect.

In their destructive potential and the forces they release, nuclear weapons are unique. Their use involves international principles, national policies, and military doctrine. Employing nuclear weapons (at any level) involves politically significant and sensitive questions. . . .⁴

The implied or actual use of tactical nuclear weapons, in any theater, will have strategic as well as operational consequences. The employment of TNW against an enemy operational reserve or at key chokepoints on the battlefield could significantly affect the enemy or friendly campaign.

Under current long-standing United States policy the President must authorize the use of any nuclear weapon; tactical or strategic. Tactical nuclear weapons are weapons of mass destruction and are generally viewed to be the first step up the nuclear escalatory ladder. The implied or actual use of TNW

would certainly reflect the strongest political and military resolve of the United States. I believe that the implied use of battlefield nuclear weapons by the United States probably contributed to the termination of hostilities in Korea. The Soviets have also recognized the military significance of employing nuclear weapons. Postwar Soviet offensive military doctrine prescribed for the employment of tactical nuclear weapons as a defacto operational "first echelon" to be exploited by Army or Front level second echelon forces. This reflected their perspective on the operational nature of tactical nuclear weapons.

Determining whether or not the Army needs to have the capability to employ tactical nuclear weapons is a challenging and somewhat complicated process. Perhaps one who has already made up his or her mind on the issue can rationally defend whatever position he or she has taken on the subject. There are a lot of myths and misunderstandings surrounding the use of nuclear weapons. For example, the destruction created against Hiroshima and Nagasaki, as terrible as it was, is not typical of the anticipated damage from a lower yield tactical nuclear weapon detonation. The level of destruction and carnage caused by a TNW is considerably less than that level of death and destruction expected from a multi-megaton explosion over a city or other highly populated target. Yet, many observers assume that the destructiveness of strategic nuclear warfare applies equally to the use of lower yield TNW. Some critics of TNW assume, perhaps incorrectly, that the employment of TNW will lead directly

to the use of strategic nuclear weapons. The focus of this discussion is not to defend tactical nuclear weapons, but to demonstrate that the subject of TNW is influenced by emotional as well as scientific arguments of yield and military effectiveness.

This paper will address the relevant military theory and history issues pertaining to the evolution of the Army's TNW capability. Most theory developed for tactical nuclear weapons employment is based upon the Cold War confrontation. Although somewhat "dated", that body of theory is still useful in addressing the research issue at hand. To provide a historical perspective on the subject I will also review the development of U.S. Army tactical nuclear weapons capabilities, force structure, and doctrine. This is important for understanding how and perhaps why the Army has arrived at its current TNW posture.

After reviewing the theory and historical perspectives pertaining to Army TNW, I will then analyze several selected criteria issues to determine whether or not the Army still requires the capability to employ tactical nuclear weapons. These criteria issues will be explained below.

Any decision to employ nuclear weapons involves significant political and military issues. Concerning the possible use of TNW in Europe, President Jimmy Carter said "a decision to cross the nuclear threshold would be the most agonizing decision to be made by any president."⁵ After forty years of TNW experience, the Army probably has a considerable institutional investment in

its TNW capability. To determine whether the Army needs to keep that capability the following criteria will be considered:

- a. What threats dictate the need for a U.S. TNW capability?
- b. What are alternatives to Army TNW?
- c. What are the costs associated with the Army's TNW capability?
- d. What are the Joint and Army doctrinal considerations?
- e. What is the deterrence role for Army TNW?
- f. What is the warfighting role for Army TNW?

THEORY FOR ARMY TNW

In the theory of warfare, the advent of the tactical nuclear weapon is a relatively recent development. In 1952, the United States Atomic Energy Commission, now part of the Department of Energy, initiated research into the development of tactical nuclear weapons.⁶ Although a limited number of atomic field artillery projectiles (AFAP) were initially developed for the huge 280mm cannon, the most significant operational deployment of a tactical nuclear capability occurred when the Honest John unguided missile, with a 40 kilometer range, was fielded to Europe in 1954.⁷

United States nuclear warfare theory has been developed, not only by scholarly oriented academic theorists and military writers, but also by practitioners such as presidents, secretaries of defense, secretaries of state, and key congressional leaders. Theoretical inquiries into the nature of tactical nuclear employment also received considerable concurrent attention in the Soviet Armed Forces in the 1950's, 60's, and 70's. The Soviets perhaps realized the operational (versus purely tactical) advantages of tactical nuclear weapons well ahead of the

Americans because the Soviets had to deal first with the prospect of being engaged with the weapons in the early 1950's. Soviet theorists realized that such weapons could disrupt not only the tactical equilibrium of the battlefield, but also alter the momentum and intensity of the operational campaign.

At the beginning of this discussion on military theory it is perhaps symbolic, if not pertinent, to examine the use of tactical nuclear weapons from Carl von Clausewitz's perspective. Of course, Clausewitz had no inkling that such weapons, or their strategic counterparts, would ever exist. "Nuclear weaponry is an illustrative example, albeit an extreme one, of how technology has changed the nature of war to a degree not accommodated by Clausewitz's model."⁸

A major thrust of Clausewitz's concept of war is the belief that considerable limitations in the ways, means, and purposes of war will moderate the natural tendency of war to escalate to extremes. From this perspective, Clausewitz prescribes the need for political leaders to exercise rational control over the military commanders in order to achieve the political objective of the war. Because of their awesome destructiveness and potential for uncontrolled escalation, nuclear weapons make possible a type of total warfare inconceivable to Clausewitz, who believed that Napoleonic warfare reflected the extremities of war.⁹ In summary "nuclear weapons make possible a kind of war that simply obliterates key postulates underlying Clausewitz's concept of war."¹⁰

In the 1950's and 1960's, tactical nuclear weapons were viewed by many civilian and military leaders as simply more powerful weapons for use in conventional warfare. This assumption, if taken to the extreme, would tend to minimize the need for a separate body of theory for TNW employment. For example, President Eisenhower, on October 30, 1953, approved language as part of his Basic National Security Policy which essentially stated that "in the event of hostilities, the United States will consider nuclear weapons to be as available for use as other munitions."¹¹ Later, in March of 1955, he stated:

Now in any combat where these things can be used on strictly military targets and for strictly military purposes, I see no reasons why they shouldn't be used exactly as you use a bullet or anything else.¹²

Eisenhower's deeper feelings on the use of nuclear weapons went beyond these simple statements. He was influenced by many factors. He wanted to prevent a Soviet incursion into Western Europe, yet he realized that a conventional force of sufficient size to deter such an aggression was prohibitively expensive. Therefore, and perhaps unwittingly, he set in motion a nuclear threatened Cold War by openly advocating the use of nuclear weapons in the advent of war in Europe. He simply was substituting the less expensive nuclear option for a more costly manpower intensive conventional force deployment to Europe. In essence, Eisenhower used tactical nuclear weapons as an economy of force measure, because the United States and its NATO allies could not field the huge conventional forces in Europe to deter a Soviet/Warsaw Pact attack.

From the theory perspective I believe Eisenhower should be credited for articulating the lower cost deterrent role of tactical, as well as strategic, nuclear weapons. During the first year of his Presidency, the United States positioned approximately 700 tactical nuclear weapons in Europe.¹³ His reputation as a World War II military genius, his personal popularity, and his constitutional role as Commander-in-Chief gave his theory great validity. In my judgment, Eisenhower was essentially one of the most significant early American theorists to address the deterrent warfighting roles of tactical nuclear weapons.

The American deployment of such a large number of tactical nuclear weapons to Europe, in addition to the increasing availability of strategic nuclear weapons for delivery by the U.S. Strategic Air Command in the event of war, had a great impact on emerging Soviet warfighting theory and doctrine. The Soviets, initially under Stalin, and later by Soviet military theorists after his death in 1953, responded in two ways: one publicly and one secretly. The public response advocated that the numerically superior Soviet Army could prevail against nuclear supported, but numerically inferior US/NATO forces. This Soviet attempt to diminish the perceived capabilities of tactical nuclear weapons was complemented by a strong campaign advocating the immorality of nuclear weapons.¹⁴ This effort was synchronized with an emerging international anti-nuclear weapon movement.

In their secret response to the development of United States TNW, Soviet theorists pursued three courses of action.¹⁵ First, they committed themselves to developing large armor heavy forces capable of operating and surviving on the nuclear battlefield. Secondly, they developed concepts and doctrine for employing these forces to operationally exploit the effects of Soviet delivered tactical nuclear weapons employed against NATO forces. Thirdly, Soviet theorists, like their American and NATO counterparts, began to stress the deterrence value of tactical nuclear weapons. In 1954, the Soviets began a serious effort to integrate nuclear weapons into their military doctrine. This tactical nuclear weapons competition between the United States and the Soviet Union continued throughout the 1950s.¹⁶

After coming to office in 1961, Robert S. McNamara, President John F. Kennedy's Secretary of Defense, initially accepted Eisenhower's theory that short range nuclear weapons, i.e. tactical nuclear weapons, would serve as a low cost counterweight to the Soviet's vast superiority of conventional forces in Europe. As both sides in Europe accumulated tactical nuclear weapons by the late 1950's and early 1960's, a new nuclear warfare theory emerged in the United States: the theory of so-called limited nuclear war.¹⁷ This theory was evolved to provide American and NATO policymakers with an alternative to the prospect of surrender or all-out nuclear (i.e., strategic) warfare. The limited nuclear war theory prescribed that an East-West confrontation in Europe could be fought in Europe with

NATO conventional forces and United States short-range tactical nuclear weapons.¹⁸

President Kennedy, probably in support of his Secretary of Defense, initially accepted the theory of limited nuclear war, but in time, despite improving the stockpile of tactical nuclear weapons in Europe, he rejected the theory. He believed the notion of limiting the employment of nuclear weapons to the battlefield in Europe during an East-West confrontation was an unrealistic expectation. He reasoned that if the nuclear threshold is crossed, then, unlimited nuclear warfare would follow. The nuclear warfare theorist, Brodie, agreed saying "once the United States uses (TNW), the enemy (will) too."¹⁹ This theory of nuclear escalation has essentially persisted to the present.

Despite President Kennedy's conviction that a limited nuclear war involving tactical nuclear weapons was impractical, the United States continued to upgrade its stockpiles of these weapons in Europe during his administration. Tactical nuclear weapons in Europe were gradually incorporated into the theory of deterrence. Should deterrence have failed, the weapons would have been available for use against the Soviet's vast conventional forces or to reply in-kind to enemy nuclear attacks. That consideration, theoretically, gave teeth to the theory that tactical nuclear weapons provided deterrence.

This discussion about the theory of employing tactical nuclear weapons has focused primarily on the East-West confrontation in Europe. This is an important dimension to understanding the evolution of tactical nuclear weapons theory. TNW employment theory has been developed and played out against the backdrop of the Cold War in general and the Central Front in particular, although the United States has reportedly stored tactical nuclear weapons in Korea for several years.²⁰

Other theorists have also contributed to evolution of TNW theory over the years. An early nuclear theorist, F. O. Miksche, writing in his Atomic Weapons and Armies was somewhat visionary in his perspective on the evolving tactical nuclear battlefield of the early 1950's. He pointed out that the outcomes of several World War II campaigns, most notably the Normandy invasion, could have been significantly altered had the Germans employed only a few atomic weapons. In perhaps the most significant statement of his theory he profoundly and simply concluded "no doubt success is more likely to be won by the side which first employs its (atomic) artillery."²¹ The thrust of Miksche's early theory is based upon his assessment that atomic weapons were exponentially more powerful than the conventional weapons used in World War II.

Richard Simpkin, writing in his Race to the Swift about three decades later, observed ". . . many fire tasks which in the nineteen sixties would have required a nuclear weapon can now (late 1980's) be tackled conventionally."²² Although

Simpkin may be accurate in his later assessment, Miksche's theory described the anticipated destructiveness of tactical nuclear weapons and their effects on battle in the 1950's: greater dispersal, faster rates of movement, and smaller formations. Miksche's work probably had some influence on the evolution of U.S. Army doctrine and force structure decisions which culminated in the birth of the U.S. Army Pentomic division. The short-lived Pentomic division experiment was a direct result of the Army's first serious effort to transition its traditional conventional warfighting capabilities to the nuclear battlefield.

From the preceding discussion regarding the role of theory in the development of the Army's tactical nuclear weapons capability, I offer three general observations. First, initial theory for the employment of tactical nuclear weapons lagged somewhat behind the development of TNW technology. A review of the literature reveals that considerably more intellectual effort has been understandably expended on the development of theory for employing strategic nuclear weapons. Tactical nuclear weapon employment theory has often been presented as an adjunct to strategic nuclear theory. As a consequence, the theory, and resultant U.S. Army doctrine for employing tactical nuclear weapons, has been somewhat limited.

A second observation is that, in the absence of scholarly or professionally developed theory, presidents and their defense secretaries have, defacto, developed and articulated significant

elements of existing theory pertaining to tactical nuclear weapons employment. As a result of this, the theory foundation for the potential employment of TNW has attained great political and strategic significance. The theory of TNW employment, in essence, has apparently been considered too important to be left to the generals.

The third observation is that tactical nuclear weapons have never been used in actual combat. Although testing, wargaming, and computer simulation over the past forty years have provided substantial insights and estimates of effectiveness, we are reminded of Miksche's observation:

. . .that A-weapons, in actual use, may prove to be less effective, especially in field battles, than is generally believed at present. But even in such an eventuality, their impact would be sufficiently revolutionary as completely to transform the nature of combat.²³

In summary, theory for the employment of TNW evolved over four decades from 1950 to the present. President Eisenhower initially theorized that TNW could be employed as relatively low cost alternatives to maintaining a large U.S. conventional deterrent force in Europe. Throughout the Cold War period, United States TNW theory continued to stress this deterrent value of TNW. Over time the theoretical distinction between tactical nuclear weapons and strategic nuclear weapons became less clear. As a result, a body of theory evolved that suggested that any use of a TNW would represent the crossing of a nuclear threshold, which could lead to a strategic nuclear exchange. Ironically, this point of view perhaps contributed greatly to

detering a conflict in Europe during the Cold War. From this perspective, the theory of TNW as a deterrent factor has been verified.

HISTORY OF U.S. ARMY TNW

1950-1962 (The Beginnings Through the Pentomic Era)

No single modern-day achievement has had a more far-reaching effect on United States Military policy and tactical doctrine as the development of nuclear technology.²⁴ In the first few years of the post war "nuclear age", the main focus of United States' nuclear warfare thought was directed at the strategic level; however, "the shift away from almost exclusive emphasis on the strategic use of nuclear weapons had begun as early as 1951."²⁵ Thus began the Army's evolution of tactical nuclear doctrine, capabilities, and organizations. This section will review that evolution from its start to present.

During the late 1940's the services were undergoing considerable competition for roles and missions in an environment of fiscal austerity. This competition pitted the Navy against the Air Force to determine which service would have the strategic nuclear mission. The Air Force essentially won that competition with the creation of the Strategic Air Command, although the Navy emerged with the authority to deploy nuclear-capable attack aircraft from its aircraft carriers and later was given authority to install nuclear missiles on submarines. The Army of the late 1940's also obtained authority to develop and field nuclear (then called atomic) weapons. "Between 1947 . . . and the end

of 1949, the Army spent \$42 million on missile research and development of artillery weapons capable of delivering nuclear projectiles."²⁶

The Army, not wanting to relinquish the nation's nuclear role to the Air Force, developed and fielded three tactical nuclear weapons system by 1954 to provide the Army with a realistic TNW capability. The Corporal surface-to-surface missile, with a seventy-five mile range, was fielded in December, 1950 as the Army's first operational nuclear delivery system. Although development of the huge 280mm "atomic cannon" was initiated in 1944 for use in World War II as a powerful conventional artillery system, it was adopted to fire the Army's first atomic artillery shells.

The first atomic artillery projectile was fired from a 280mm gun on May 25, 1953.²⁷ Shortly thereafter, the Honest John surface-to-surface missile entered service in 1954. Honest John was smaller and more mobile than the Corporal, but had a shorter range. Each of those systems was designated for assignment to what would now be described as "echelon above corps." The 280mm atomic cannon battalion, consisting of six guns organized into three firing batteries, was slated for assignment or attachment to field armies or separate corps as general artillery. The Corporal battalion, with twelve missile launchers, was deployed under the command of what was then the field army echelon to "augment conventional fire."²⁸ In essence, the 280mm cannon and the Corporal were "grafted onto existing conventionally oriented

organizations at the highest possible level."²⁹ This perhaps reflected the then prevalent Army notion, one apparently shared by President Eisenhower, that these weapons were basically only more powerful conventional artillery. The nuclear-tipped Redstone missile was fielded in 1956 as the Army's fourth TNW system.³⁰

Prior to 1953 there was no serious effort in the Army to develop any organizational or doctrinal warfighting changes to accommodate the employment of tactical nuclear weapons. While the Army was aggressively acquiring a capability to employ tactical nuclear weapons, its attempts to develop a target acquisition system to acquire "deep" targets to engage with the Corporal or 280mm atomic cannon were less successful. The doctrinal and force structure integration of these new weapons into the Army was almost nonexistent. Perhaps an even more disturbing prospect was the failure to realistically appreciate, not only the hazards of operating in a friendly produced nuclear environment, but also the prospect of being on the receiving end of an adversary's tactical nuclear weapons. This prospect assumed greater significance after the Soviets deployed their own tactical nuclear weapons.

Concerns about the nature of a future nuclear battlefield were not lost on the Army leadership. Starting in 1953, "the Army undertook the most far-reaching revisions of its force design, doctrine, and strategy in the entire post World War II period. . . (to) build units capable of exploiting the

(friendly) effects of battlefield nuclear weapons."³¹ This effort culminated in the creation of the eventually unsuccessful Pentomic division concept. The Pentomic division was a reorganized Army division structure intended to give the Army division the degree of mobility, flexibility, firepower, and survivability necessary to operate and win on the nuclear battlefield.³²

The Pentomic division was so named because the division was organized into five infantry battle groups, each commanded by a colonel and consisting of five companies. There was no maneuver battalion organization in the division. The division structure was conceived to conduct nuclear or conventional operations. To its credit, the Army conducted a comprehensive series of field tests and high level studies on the Pentomic division in the late 1950s.

The Army's extended efforts (to develop the Pentomic organization and doctrine) . . . failed to produce any useful battlefield capability. Tests of the new division design and doctrine . . . rejected not only the specific design of the Pentomic division, but also the general approach of building "dual capable" divisions for nuclear and conventional environments. The three (test) agencies confirmed that the Pentomic division could not effectively wage two-sided nuclear operations.³³

Unfortunately, the bottom line of these evaluations was the realization that ". . . battlefield nuclear operations remained beyond the Army's capabilities in the 1950's."³⁴ In general, the Pentomic concept called for atomic fires to be delivered by what are now "echelon above corps" artillery organizations.

During the 1950's the Army was pulled in different directions by competing forces. First, the Army had to deal with a "no-notice" major land war in Korea while maintaining a credible deterrent force in Europe. Following the Korean War, the Army was forced to endure a substantial reduction in force, while trying to undergo a force modernization. To cut defense expenditures President Eisenhower directed the Army to pursue a "New Look."

Eisenhower's "New Look" policy caused the Army to absorb budget and force structure cuts to help pay for the Air Force's buildup of strategic bomber forces. Many government officials, including President Eisenhower, a man who spent his adult life in the Army infantry, basically assumed that the "next war" would be a "push button" strategic nuclear war needing less conventional Army forces. In response to these considerations, the Army pursued its own program to develop surface-to-surface missiles, in direct competition with the Air Force. The Army also emphasized the potential warfighting value of tactical nuclear weapons to ensure that the Army's future institutional role was not further diminished. These organizational tensions undoubtedly consumed creative energy that perhaps could have, and more to the point, should have been devoted to developing realistic and relevant doctrine for integrating nuclear and conventional capabilities.

The ROAD Division to 1990

As the Eisenhower administration ended, a consensus emerged within the nation's defense community calling for the Army to refocus its emphasis to fighting on conventional non-nuclear battlefields and in the low intensity conflict environment. This did not completely repudiate the need for a tactical nuclear weapons capability, but recognized that the future battlefield would probably not be nuclear.³⁵ On 25 May 1961, President Kennedy . . .

directed his Secretary of Defense to reorganize the Army's divisional structure away from the atomic battlefield. . . toward an organization emphasizing increased non-nuclear firepower. . . The abandonment of the Pentomic division concept meant a transition from a virtual dependence on nuclear weapons to almost exclusive dependence on conventional weaponry.³⁶

President Kennedy's guidance reflected the advice he received from his senior military advisor, General Maxwell Taylor (USA, Retired), who later was recalled to active duty to serve as the Chairman of the Joint Chiefs of Staff. Taylor's "flexible response" concept, adapted by Kennedy as his own, caused the Army to focus on fighting non-nuclear battles and obscured the need for a fully developed tactical nuclear doctrine. Underlying the doctrine of "flexible response" was a realization that, by 1960, the Soviets also had substantial tactical and strategic nuclear weapons to offset America's nuclear inventory.

. . . When the Soviets began deploying their own tactical nuclear systems. . . in Eastern Europe - much earlier than had been anticipated in the West - the utility of NATO's (i.e. the United States) tactical nuclear doctrine began to erode.³⁷

To comply with President Kennedy's guidance, the Army developed the Reorganization Objective Army Division (ROAD) concept. The basic ROAD organizational goal was flexibility, to be achieved through the concepts of strategic and tactical tailoring. This theme was diametrically opposite the rigid Pentomic structure. The ROAD division featured a standard division base, three brigade headquarters, and a number of maneuver battalions.

Although nuclear operations were not explicitly considered in developing the basic architecture of the ROAD division. . . the battalion configuration allowed greater dispersion within the division and therefore an improved battlefield nuclear capability.³⁸

The basic imprint of the ROAD division, though modified, can still be observed in the United States Army division structure of 1990. Following the creation of the ROAD division, American technology also provided a boost to the Army's tactical nuclear weapon capabilities. By the late 1950's the Army had fielded the Davy Crockett weapon system, 155mm and 203mm nuclear artillery projectiles, and the Pershing and Sergeant missiles. Three of these systems, the Davy Crockett the 155mm howitzer, and the 8-inch howitzer were organic to the ROAD division.³⁹ Interestingly, the Davy Crockett was a battalion level fire support system with a range of only 1.25 miles.⁴⁰

The Army ROAD division as it has evolved to the present is primarily a conventional warfighting force that also has the capability to fire TNW when those munitions are authorized and available for use. When the ROAD divisions were first fielded, Army doctrine for the nuclear battlefield reflected a general uncertainty about the potential role of nuclear weapons in land combat. Although ROAD division artillery systems are dual capable (conventional and nuclear), doctrine and training for Army artillery units have primarily focused on the conventional role for the past 30 years.

Under the direction of President John F. Kennedy's Secretary of Defense, Robert S. McNamara, the Army conducted a series of analytical efforts in the early 1960's to develop insights for defining the proper role of Army battlefield nuclear weapons. From these studies, the Army identified doctrinal, organizational, and operational shortfalls in its capability for employing tactical nuclear weapons. The most important evaluation, conducted by the Conway Board, expressed concern about the Army's ability to conduct nuclear operations. However, the Conway Board still recommended that the Army expand its TNW arsenal. "In making this recommendation, the Conway Board emphasized the existence of (tactical nuclear weapons) improved the deterrent effect of Army forces."⁴¹ At this point, the deterrence role of TNW appears to have assumed ascendancy over the battlefield role of TNW. This political dimension enabled the Army . . .

to view the nuclear battlefield as an abstraction useful in justifying (tactical nuclear) weapon . . . procurement, but not requiring fundamental changes in force design or doctrine.⁴²

From 1965 to 1975, the U.S. Army lost a decade of conventional weapons, force structure, and doctrinal evolution while participating in the Vietnam War. After Vietnam, the Army refocused its institutional orientation to defense of Europe and conventional warfighting vis-a-vis its counterinsurgency role in Vietnam. The Army returned once again to a "flexible response" type orientation to include renewed emphasis on TNW missions. "Policies for nuclear and conventional battlefields underwent their most extensive revisions since the mid-1950's."⁴³ During this period, the Army fielded the Lance missile, a corps level weapon system, capable of delivering nuclear or other munitions out to a range of 75 to 80 kilometers. During this same period, the lethality of modern conventional non-nuclear warfighting greatly increased also.

For example, the 1973 Yom Kippur War provided a stunning insight into the lethality of modern conventional warfare. "The characterization of the (modern) conventional battlefield as highly lethal had the effect of reducing the apparent difference between nuclear and non-nuclear operations."⁴⁴ This supposed convergence of lethality between conventional and nuclear weapons resulted from emerging technologies which can produce lower yield TNW and increasingly accurate and lethal conventional munitions for future war. However, in the 1970's, the Army

continued efforts to modernize its tactical nuclear weapons capabilities. During this period Presidents Gerald Ford and Jimmie Carter both supported modernizing Army TNW inventories. Carter concluded:

Tactical nuclear weapons, including those for battlefield use, have strongly contributed to deterrence of conflict in Europe. I believe we must retain the option they provide, and modernize it.⁴⁵

However, the Army was unable to field enhanced radiation weapons (ERW), the so-called "neutron bomb," to Europe when President Carter cancelled that program. That type of artillery delivered TNW would have used a short duration enhanced radiation effect to kill enemy tank crews and other combatants, while producing relatively minimal shock or blast effect.⁴⁶ Although President Carter made this decision for reasons of conscience after considerable deliberation, his decision was ironic. In theory, the weapon would have produced considerably less collateral damage if employed to defeat a Soviet invasion of Western Europe. In other words, according to its proponents, the enhanced radiation weapon would have enabled us to save a village, to use a Vietnam era metaphor, without having to destroy it.

During the 1980's, several improvements were made in the Army's capability to employ tactical nuclear weapons. The Army streamlined its procedures for planning and requesting TNW release authority and continued to upgrade its TNW stockpile. The

Army also fielded the nuclear-armed Pershing 2 surface-to-surface missile to provide an accurate theater level nuclear weapon system. The Pershing 2 provided an intermediate range or theater level nuclear weapon to bridge the gap between tactical nuclear weapons and strategic nuclear weapons in response to the threat faced in Europe. The life of the Pershing 2 was quite short. In 1988, the United States and the Soviet Union signed the intermediate Nuclear Forces Treaty. This treaty led to the total elimination of the Army's Pershing 2 system and the United States Air Force's ground launched cruise missile (GLCM) in exchange for the elimination of several types of similar Soviet missiles.

Today, nuclear capable artillery units of the Army maintain a high state of readiness to deliver tactical nuclear weapons with 155mm and 203mm caliber artillery systems and the Lance surface-to-surface missile. There have been critics, in and out of the Army, who contend that the Army has not established a definitive workable doctrine for integrating nuclear fires in support of today's AirLand Battle doctrine. However, as the last decade of the twentieth century unfolds, the Army in the field has a substantial short range capability to deliver nuclear ordnance against a potential enemy on the battlefield. In developing the TNW capabilities over the past four decades the Army has experimented with the Pentomic division and the ROAD division concept. The Pentomic concept was discontinued shortly after its introduction in favor of a more balanced ROAD Army division.

that can function on the conventional or nuclear battlefield. After developing a variety of missile delivery systems over the years, the current Army TNW capability is limited to short range cannon artillery delivery system, and an aging Lance system. Revised Army doctrine for employing TNW is contained in FM 100-30 Nuclear Operations in Support of AirLand Battle, which is currently awaiting approval at Headquarters, U.S. Army Training and Doctrine Command. A companion manual, FM 25-50 Corps and Division Nuclear Training, has been developed to provide guidance on how to train U.S. Army units to operate on a nuclear battlefield. Despite this, the ability of any Army to operate on a nuclear battlefield has never been demonstrated.

ANALYSIS

In the introduction section of this paper I listed six criteria questions to be used in determining whether the Army needs the capability to employ TNW. These questions will be addressed below. I gave considerable thought to including the political dimensions of TNW employment as a criteria, but decided not to do so because the political issue is equally pertinent to the use of any nuclear weapon, tactical or strategic. However, in my discussion of the cost criteria, I will address the political dimension to a limited degree.

Threat

Foremost in assessing the need for any weapon system is the nature of the threat or threats against which that system might

be employed. Threat is the ability of an enemy or potential enemy to limit, neutralize, or to destroy the effectiveness of a current or projected mission, organization, or item of equipment.⁴⁷

The threat will vary by theater and within any given theater. The threat may support the need for a TNW capability in one theater while in another the threat does not. For example, ground operations conducted against a large well-equipped army that has chemical and/or nuclear weapons might dictate the need for the Army to have an in-kind capability. On the other hand, operations against a non-nuclear capable force might not support a requirement for an Army TNW capability.

As the prospect of a war with the Soviet Union/Warsaw Pact continues to diminish, the greatest conventional and nuclear threat faced by the Army diminishes too. However, the Soviet Army will likely remain a large modern nuclear armed force with strategic and tactical nuclear capabilities.⁴⁸ Increasingly sophisticated military capabilities in the developing world, (to include chemical and possibly nuclear weapons) have given rise to a challenging, complex, and dangerous global security environment.⁴⁹

More than a dozen developing nations have 1,000 or more main battle tanks, and a similar number possess ballistic missiles or have access for their development.⁵⁰ Chemical weapons are rapidly becoming low cost weapons of mass destruction (the poor man's nuclear equivalent weapon perhaps) for poorer nations.⁵¹

No currently projected military threat presents the magnitude of capability to the U.S. Army that characterized the pre-Gobachev Soviet Union. However, the conventional and potential chemical and biological threat posed by Iraq, as of this writing, is extremely serious to United States forces deployed for Desert Shield. In my judgment, the only other projected military threat that might warrant the employment of Army TNW in the near future is North Korea. As nuclear weapons technology spreads throughout the world, despite superpower efforts to the contrary, it is always possible that U.S. Army forces could, at some point in the not too distant future, face a nuclear or chemical/biological armed threat.

Alternatives to Army TNW

Should a warfighting CINC be placed in an environment where he needs the capability to employ TNW he could receive such support from U.S. Air Force or U.S. Navy delivered TNW if Army TNW are not available. With the "jointness" of United States military operations a reality, the prospect of an Army-only conflict is remote. Having TNW available, if needed, for delivery by the Air Force or Navy to support the CINC could reduce the requirement for the Army to employ TNW in support of that CINC. Navy or Air Force delivered TNW can also be delivered against enemy targets at significantly greater ranges from the forward line of troops (FLOT), an obvious advantage over limited range cannon or Lance delivered TNW. Using Navy or Air Force TNW would also preclude the need for the Army to store, secure,

transport and fire TNW from relatively forward locations within striking range of enemy ground forces. However, current Air Force or Navy TNW delivery systems may not be optimized for employment against mobile battlefield type targets.

The use of TNW delivered by other than Army systems may be a practical alternative to employing Army TNW in combat or demonstrating the capability to do so. There is another possible alternative to the employment of Army TNW:

During the past several years an argument has been made in the unclassified literature that (so-called) advanced conventional weapons (ACW) are equivalent in effectiveness to TNW for battlefield use.⁵²

Those who advocate this technology trend predict "that it will lead to. . . replacement of nuclear weapons munitions with more accurate (and presumably more powerful) conventional ones."⁵³ ACW have not yet been fielded in meaningful quantities, and according to a study conducted for the Defense Nuclear Agency (DNA) ". . . it is clear that TNW with sufficient yield can achieve higher percentages of damage than ACW and at lower cost."⁵⁴ While concluding that TNW can achieve considerably higher percentages of enemy unit destruction at lower cost than ACW, the DNA study recognized that timely procedural and political limitations that precede the employment of TNW can offset the technical and tactical advantages afforded by TNW in a combat situation where time is critical. Interestingly, the study determined that ACW inflict more damage to equipment than personnel, while TNW inflict significantly more enemy casualties.⁵⁵

Cost

Comparing the relative cost of using TNW versus the cost of employing other elements of combat power is a complex issue. Current cost figures associated with TNW are classified and are not available for this unclassified examination. However, an order of magnitude for the cost of nuclear shells vis-a-vis conventional shells can be extrapolated from the minutes of a 1973 Congressional hearing. Those minutes reported that a nuclear 155mm shell cost about \$452,000 compared to a conventional 155mm round cost of \$191⁵⁶. For a 203mm nuclear shell, the cost was estimated to be \$400,000 compared to \$56.00 for a 203mm conventional round.⁵⁷ Of course, the cost of handling, storing, and securing nuclear munitions is also higher than that associated with conventional artillery.

The identification of resources committed to the employment of TNW is difficult once the weapon has been issued to the firing unit, because Army TNW are employed by existing dual capable conventional artillery organizations that can fire nuclear or non-nuclear munitions. However, those units invest heavily in training and security procedures to retain the high degree of proficiency required to properly handle and fire TNW. Nuclear mission requirements, peacetime and wartime, detract from a cannon artillery battalion's capabilities to fight the conventional battles.⁵⁸

There are also other costs associated with the Army TNW capability. At the European theater level, approximately thirteen

hundred civilian and military personnel positions are employed in storing, maintaining, securing, and distributing Army TNW.⁵⁹ Removing Army TNW from that theater alone would eliminate those positions. Elimination of all TNW from the Army would undoubtedly permit some reduction in scientific, administrative, security, logistical, and other support personnel involved in the retention of Army TNW.

Are TNW "cheaper" or more cost effective than conventional weapons? In an isolated comparison, where an appropriate battlefield target is selected, the TNW will generally destroy a suitable target more efficiently and effectively than non-nuclear fires. Perhaps, the most important cost associated with Army TNW is the retention of a weapon system that some expect will never be used. As the Desert Shield employment unfolded in 1990 the Los Angeles Times reported:

After considerable debate among the Joint Chiefs of Staff, a decision was made early in the crisis not to deploy tactical nuclear weapons with Army, Air Force, or Marine Corps units sent to the area. . . [S]ome Navy ships in the region. . . customarily sail with nuclear weapons. . . [however,] their presence [in the region] is not meant as a threat to use them.⁶⁰

The deterrence and warfighting roles of TNW can probably be executed by Air Force or Navy TNW, especially if joint procedures are refined to ensure availability of these capabilities to Army forces if deterrence fails. The elimination of Army TNW would certainly save a considerable sum of money at a time of fiscal austerity.

Joint and Doctrinal Considerations

Review of recent TNW related joint and Army doctrinal publications indicates that the Army has adequate procedures and doctrine for employing TNW in support of a warfighting CINC. This assessment was verified by discussions with subject matter experts at the U.S. Army Command and General Staff College. TNW employment doctrine is exercised in command post exercises, and the U.S. Army artillery community fully comprehends its responsibilities to provide nuclear fires if directed to do so. However, training Army forces in the field to conduct sustained operations in a nuclear battlefield environment is a continuing challenge.

The employment of Army TNW in a future conflict would undoubtedly be in conjunction with a joint operation conducted in a theater of operations under the command of a designated joint commander. The procedural ability to execute these TNW missions exists. However, the equipment to execute such a mission is limited because of the relatively short range of Army systems. The procedures for obtaining "release authority" to employ TNW have been streamlined over the past few years, but there is still some concern about being able to obtain timely release authorization. The Army has ample 155mm TNW delivery systems to execute its doctrinal mission, but the 203mm artillery system is being gradually phased out. The future of the old Lance system is uncertain and the 1989 decision to terminate the Follow-on to Lance project leaves the Army without a viable theater level

nuclear surface-to-surface missile capability. From a joint and doctrinal perspective the Army can deliver TNW against properly selected targets.

The Deterrence Role for Army TNW

The deployment of large numbers of Army TNW in Europe during the Cold War contributed to deterrence. The exact TNW contribution to deterrence is difficult to estimate because America's strategic nuclear arsenal and substantial conventional military capabilities also contributed. Deterrence appears to have worked in Europe and in Korea after 1953. A deterrent is credible if it is perceived to be a capability which not only can be, but also will be employed, if circumstances warrant. The possession of TNW by U.S. forces did not deter Saddam Hussein from confronting the United States over Kuwait in 1990-1991. While the deterrence role of TNW in Europe during the Cold War is generally recognized, the deterrence value of TNW will probably be minimal in future confrontations against non-Soviet threats because the United States has demonstrated its extreme reluctance to use TNW in Korea, Vietnam, and Iraq. The decline of the deterrence value of TNW can also be partially ascribed to the development of America's high technology non-nuclear arsenal which contributes to a reduced need for TNW. The overwhelming U.S. conventional military capability, which will be used if necessary, probably constitutes a greater deterrent to non-Soviet threats than a TNW capability, which probably would not be used.

The Warfighting Role for Army TNW

Although the future deterrence role of Army TNW is subject to debate, the warfighting potential of such weapons is clearer. Undoubtedly Army TNW currently constitute a significantly lethal element of combat power. However, except for the aging Lance system, current delivery systems simply do not provide the range flexibility that such a capability ideally needs. Short range TNW systems do not provide the "deep attack" capability needed to support AirLand Battle doctrine. Cannon fired TNW, though lethal, must be fired relatively close to friendly forces on a linear or non-linear battlefield. This condition raises the potential for radiation caused fratricide.

CONCLUSION AND IMPLICATIONS

The United States. . . is continuing to modernize its. . . nonstrategic nuclear forces, including artillery-fired atomic projectiles, dual-capable aircraft, nuclear gravity bombs, and the nuclear version of the Tomahawk sea-launched cruise missile.⁶¹

In the 1950's, the Army, needed the capability to employ TNW for a variety of reasons, not the least of which was the existence of a serious threat in Europe. An institutional concern for survival of the Army in the emerging "atomic age" also supported the acquisition of a TNW capability. Since that time the Army has sought to upgrade its nuclear munitions and delivery systems. The most significant Army nuclear capability was fielded when the Pershing 2 surface-to-surface missile was deployed in the mid 1980's. The Pershing 2, an intermediate or

theater level nuclear system, was scrapped as part of the 1986 Intermediate Nuclear Forces Treaty between the United States and the Soviet Union. With the 1990 cancellation of the proposed Follow-on-to Lance system, the Army appears to have lost its opportunity to possess a capability to employ accurate long range nuclear fires in support of the theater CINC. The Army in 1990 only has artillery delivered TNW of limited range and an aging Lance system.

Although the threat of conflict in Europe is reduced, the Soviet Union still retains substantial conventional and TNW capabilities. The probability of a conflict in Korea is decreasing. The Republic of Korea has fielded a large modern conventional defense-oriented force. In the event of war in Korea, the need for current Army TNW is questionable. Other threats around the world, especially Iraq, pose a serious conventional and chemical threat. These future threats might warrant the retention of an Army TNW capability. However, the ongoing reduction of the threat in Europe greatly impacts on the need for the Army to retain its TNW.

The cost of maintaining the Army's TNW capability is difficult to assess in dollars, although a typical nuclear artillery round, based upon evidence presented above, may cost up to 2000 times the cost of a conventional artillery projectile. Approximately 1300 military and civilian personnel are involved in warehousing, transporting, and securing Army TNW in Europe. In warfighting terms, the relative costs are simpler to compute. A

low yield TNW packs a knockout punch unmatched by any other form of firepower when employed against appropriately selected targets. Because no nation has ever employed a TNW in combat, the full medical and psychological impact of such weapons is not fully understood.

The possession of Army TNW, which probably won't ever be fired, is potentially an unnecessary cost, regardless of the dollar amount involved. Artillery units charged with the mission to fire TNW spend considerable time training and preparing for that role. That is also a cost because those efforts might be better expended on other important warfighting training and readiness tasks. Army TNW are probably more cost effective than other munitions when employed against appropriately selected targets. However, Air Force or Navy TNW could probably be employed against most, if not all, of those targets if Army TNW are not available.

The employment of Army TNW is consistent with current and evolving Joint and Army doctrine. However, a future nuclear battlefield will undoubtedly present great challenges for leadership, maneuver, medical care, command and control, and materiel sustainment for Army forces. Force dispersion and mass will be drastically affected if an adversary introduces nuclear weapons to the battle. The Army has sufficient 155mm artillery.

systems to employ TNW using division or corps assets. Unfortunately, the range of those systems is limited and the slightly longer range 203mm artillery system is being withdrawn from the inventory.

After discussions of yield, range, doctrine, and a variety of other pertinent issues pertaining to the use of TNW the central issue that emerges is the political one. Will a President authorize the use of TNW in a future war? Tactical nuclear weapons are not really "tactical." They are linked directly to strategic nuclear weapons on the ladder of nuclear escalation. In fact, one perhaps should think of nuclear weapons tactically employed or nuclear weapons strategically employed. Nuclear weapons have acquired tremendous moral and political significance. This factor undoubtedly enhanced the deterrence value of nuclear weapons. Undoubtedly, the Army's TNW capabilities have contributed to that deterrence role over the years. However, the changing geopolitical environment in Europe has substantially reduced the deterrence value of Army TNW.

The command and control of TNW in war would probably be strengthened by reducing the number of services equipped with TNW and centralizing control at theater level. The Air Force comes to mind as the service most appropriate to deliver TNW in support of ground operations in a given theater because of that service's traditional air support role to the Army. In an immature theater, where Air Force TNW assets might be initially

limited, the U.S. Navy could be tasked to deliver TNW using naval aviation or ship-launched cruise missile capabilities.

The purpose of this research project was to determine whether or not the Army needs the capability to employ TNW. The simple answer is a qualified no. The qualification is important. Before the Army relinquishes its TNW capability several actions should occur. First, the Department of Defense should clearly assign the TNW mission to the Air Force and the Navy. Then, procedures must be established for joint targeting and mission tasking. Finally, the Air Force and Navy must develop and acquire nuclear munitions and delivery systems to engage the types of targets against which Army TNW are employed. The Air Force and Navy would also need to retain their traditional TNW capabilities so that a theater CINC would have a full range of TNW options for deterrence and warfighting roles. In the warfighting role there are three basic situations where the theater CINC might request authority to employ TNW. These situations, not necessarily listed in priority, are:

1. To preempt or retaliate for an enemy's attempt to employ nuclear or other weapons of mass destruction.
2. To successfully defend against or defeat a superior enemy force if conventional options fail.
3. To favorably terminate combat decisively and quickly to reduce substantial American or allied casualties that would occur if combat continues.

The armed forces of the United States have entered an era where the joint nature of military operations will be emphasized and forces in a given theater will operate under a theater CINC. The Air Force and the Navy now have some capability to deliver

nuclear weapons in support of ground operations against enemy targets in support of a theater CINC's campaign. When these current capabilities are modified as discussed above, the Army can relinquish its current TNW capability. However, the elimination of the Army's TNW capability should only be accomplished as part of a negotiated TNW reduction treaty with the Soviet Union. It would be imprudent to eliminate thousands of Army TNW while the Soviets retained their large inventory of comparable TNW.

The Army's TNW program has served the nation and the Army well for decades. A changing threat environment, increasing impetus for joint operations, and a need to avoid unnecessary TNW redundancy among the services in an era of fiscal restraints all combine to compel the Army to relinquish its TNW capability.

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